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N 64 81501 *

Code None

SPACE PHYSIOLOGY
(NASA Contract
NAS 2-1357)

December 1963 Progress Summary, Space Sciences Laboratory Series 5, Issue 8

The single unit blood pressure transducer-transmitter is being modified to increase the stability of its circuits and to improve its capability in measuring pressures. Mechanical motion of the transducer diaphragm will be severely limited. This makes possible a very close approximation to true pressure measurement and will decrease errors caused by changes in the arterial wall. This change in the transducer will make it necessary to increase the sensitivity of the sensing element.

Several test circuits have been built, two of which have been incorporated in units which are now undergoing tests for the efficiency of the present potting and construction techniques. A third circuit, designed by Mr. Jenkinson, has been built and is being tested. Results show that this circuit is capable of providing a stable oscillator, independent of temperature, provided that the coils do not change in inductance as a result of temperature changes.

Tests show that some temperature sensitivity lies in the transducer and transmitter coils. Some work has been started towards possible elimination of the transmitting coil and modification of the transducer coil to eliminate the temperature sensitivity of this component. Transducer-transmitter circuits of continuously transmitting types and blocking types were studied. Various characteristics were observed among the many types of oscillators investigated.

Transmitters have been developed which are capable of transmitting three different types of data simultaneously with very low power. A series of measurements was made in a 65,000 gallon salt water tank to test the effectiveness of low level signals through salt water. The feasibility of telemetering from diving mammals and from fishes was demonstrated. The transmitted signals could be received at distances up to 50 feet. These measurements also further elucidated the manner in which signals are transmitted through an animal's tissues. Associated with this work was the investigation of a new type of transmitting antenna which consists of an insulated dipole with conducting end electrodes. This proved considerably more efficient than the loop (magnetic dipole) antenna which

has previously been almost universally used.

In collaboration with a group at Oak Knoll, swallowable pressure transducers were used to study the peristaltic patterns in human beings. Mr. Harvey Fishman has succeeded in detecting the magnetic field induced as an impulse and propagated along a nerve bundle. By using a calibrated amplification system, he was able to make the first estimation of the magnitude of this field. It was found to be several hundred microgauss. Two review articles on the subject of telemetry have been prepared.